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Editorial

Heeding Pain's Prescription

James Giordano, PhD[1,2], and John R. Shook, PhD[3]

Newer definitions of pain remain suggestive of categorization by mainly neurological or psychological bases. All pain recruits cortical interpretation for any sort of directive effects in awareness, attention, and action. That unity of purpose in pain's multi-pathway manifestations can inspire neurophilosophical reflections on the existentiality, subjectivity, and sociality of pain. Pain is neither so subjective as to be relieved of meaning, nor so objective that multi-modal approaches can take turns at targeting its relief. The problem of objectifying the subjective is essential for addressing issues of assessing and treating pain. Integrative plans for pain care make sense if and when all aspects of pain's character are deemed to be integral, and are actually integrated in both theory in practice. A standpoint on the "entity-identity" of pain afflicting the whole person implies that pain is expressed behaviorally and as articulately as circumstances permit. Pain speaks, even for those not able to speak, as their patterns of brain activity may be representative of pain. Heeding pain's prescriptive voice requires collective interpretations before attempting coordinated treatments. Pain's prescription will remain unfilled until its full reality is recognized at a personal level, where comprehensive care is mobilized for the whole patient. Heeding pain looks to the central figure that is never absent from any painful situation, namely the individual person-in-pain. That holistic and humanistic value to mobilizing resources against pain should be reflected in the practice of pain medicine, and the craft of the pain physician.

Key words: acute pain, chronic pain, nociception, nociperception, brain, subjectivity, neuroscience, neurophilosophy

From: [1]Departments of Neurology and Biochemistry and Pellegrino Center for Clinical Bioethics, Georgetown University Medical Center, Washington DC; [2]Department of Defense Medical Ethics Center, Uniformed Services University of Health Sciences, Bethesda, MD; [3]Philosophy, Politics, and Economics Program, Bowie State University, Bowie, MD

Address Correspondence:
James Giordano, PhD
Departments of Neurology and Biochemistry and Pellegrino Center for Clinical Bioethics, Georgetown University Medical Center, Washington DC
E-mail:
james.giordano@georgetown.edu

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The psychology and neuroscience of pain, along with terminology and classification refinements, have undergone dramatic developments in recent decades (1). A lessening dependency on pain localization by pathologies could be one message from recent revisions to definitions for pain; a heightened sensitivity to holistic and person-level contexts may be another (2). Yet, growing ramifications arising from multi-factorial approaches to the patient in pain may not become better clarified in the process. Updated accounts of pain could be understood to mean that some types of pain are more about neuropsychological or belief-behavioral issues, while other types are rooted in neurophysiological substrates. But, as matter of fact, the psychological and physiological both entail neural substrates. In truth, we are each and all (neuro)bio-psychosocial beings, and subject to very real pains of each and every type because we are living subjects with complex lives within complicated socio-cultural environs.

Along the way, a viable question may be whether this undeniable progress in acknowledging the complexity of pain should imply that responsibilities for pain care can best be parceled and distributed by specialty. That question was witnessed in the ways that medical models seemed to dispel seemingly "causeless" pain, and the uptake of certain types of pain care by psychological and/or psychiatric engagement. But, in so doing, an implicit

– if not often explicit – message was that certain types of pain were "merely" psychological, and in this way, subject to particular social stigma and biased regard. Dominant models and dichotomies have shifted, however. Past (government-funded) enterprises in brain and pain sciences, such as the United States' Decade of the Brain, the Decade of Pain Control and Research, and the BRAIN Initiative, along with the European Union Human Brain Project have generated instructional knowledge that is instrumental to improving medical care as well as reorienting ethical priorities (3). Just as brain-centric research has encouraged broadly integrated approaches, we opine that identifying pain itself, not simply for the conveniences of particular domains of treatment specialty, ought to be central rather than coincidental for genuine accounts of pain, and for realistically grounded practices of pain medicine (4,5).

As such initiatives have shown, both the science(s) and the treatment(s) of pain proceed in their empirical and experimental courses, with multiple fields and disciplines exploring how pain engages both sense and sentience at a variety of scales. The multidisciplinary embrace of pain fosters hope – and even expectation - that all practitioners are emboldened to step forward in ownership of a responsibility to address patient suffering just as much physical recovery. Heeding pain looks to the central figure that is never absent from any painful situation, namely the individual person-in-pain. Both the neurophilosophy of pain (the emphasis of this essay) and the neuroethics of pain (in subsequent essays) maintain the painient person as the focus of clinical and ethical attention.

Integrative plans for pain care are valid, viable, and valuable if and only if the components of pain's character are integral, and actually integrated in both theory, and (primarily and most importantly) in implemented practice (6). A complex and pluralistic approach to pain can indeed bring many voices to the discourse(s) about what pain is, and what pain treatment is all about (7). But let these voices not be disharmonized; cacophonies are not choruses, and orchestration proceeds best when there is a conductor. A tentative consensus on a definition to pain does not necessarily evoke resulting consensus about treating pain. Modular views of pain tend to elicit fragmented and fractional treatments of pain. Multi-field and multimodal treatments are important, to be sure, but not when inchoate in articulation (8). This provokes the question: Doesn't the acknowledged biopsychosocial reality of a person (and the person-in-pain) necessitate an equivalently triune approach to pain?

The Entity-Identity of Pain

To commence toward a response, let us begin with a postulate, namely that pain can "speak" for itself. Pain feels built into our being as natural organisms in an often-hazardous world. Therefore, a philosophy of pain must address both the ontological question of "What is it?" and the axiological issue of "Does it matter?" Pain considered in itself doesn't appear to need such interrogations, or philosophical adjudications should the 2 questions be answered incoherently. Pain is just painful, without mistake or a misleading quality. That seems simplicity itself. All the same, pains convey more than their transparency. Pain puts one on alert that something is wrong, as that sign of pain surely matters to a search for its relief. However, pain's intensity can often belie its directional signal. Pain frequently cannot answer for what it really is, and this can impede efforts at relief. Unrelieved pain can disrupt or even overwhelm emotional, cognitive, and behavioral control. Pain can become illness unto itself. The question, "What is that kind of pain about?" brings the entirety of the sufferer again into focus. Pain speaks not to just the sufferer, but to whatever assistance may be available. Pain is "inside us," but pain's voice stands out among us.

Considering pain as a forceful sensation certainly makes it stand out. Sensory fields for both exteroception and interoception offer deluges of impulses that may or may not be worth attention, with varying intensities that cannot be automatically trusted with importance. Sensory input is ever-present and gently insistent. Still, any signal value amongst the backdrop of noise has more to do with attentiveness, intention toward current and future aims, and directed activities. Those sensations that get perceived must be parsed for relevance and judged as means. Beyond the familiar acute vs. chronic division, a distinction between peripheral and cerebral processing for pain (9-11) doesn't mean that some pains arrive thoughtlessly and others are lingering in thought. What neural units are doing in response to high threshold input, insult, and/or damage counts as nociception, but central nervous interpretations arouse felt pain able to trouble an organism's own "way of being" – in *Existenz,* as the psychiatrist-philosopher Karl Jaspers has called it (12). All pain moves us, both literally (i.e., for reflexive response) and figuratively (cognitively/emotionally). Initial biopsychological and neurophilosophical observations are useful here to set out an essential relationship between animating pain and the animated life world of the person-in-pain.

Nociception appeared in early animals, perhaps as soon as basic neural nets prompted differential activity, but noci-perception recruits greater cognitive resources. More complex nervous systems throughout the complex animal body, but not mentally above a body, yield affective states that motivate whole-organism responses. Where the entire body is concerned, cognition plays a (literally) critical role, perhaps not quite first, but indubitably somewhere on the way to any behavioral response. Cognition enables discriminative weightings to evocative stimuli as being sensible and salient enough for attendance and response, thereby obtaining particular functional parsimony, and furthering the energetics and intents of the organism (13,14). Anything accounted to awareness's capacious interest, from the sensate and observational, to the emotional, valuational, and judgmental, arrives through cognition ready for further consideration, whether of a faster or slower sort (15).

As a species, we call and regard ourselves to be Homo sapiens, the knowing human; and, not coincidentally, our pain imbues a kind of "knowing" as well. Pain has mattered greatly to humans, as evidenced by humanity's historical attendance, dedication, and efforts to it (16). Pain matters, not simply to each in our personal privacy, but to all in our common humanity. Labeling pain (merely) as a sensation hardly does it justice. Even "simple" pain existentially announces a call for its relief, more or less immediately (17,18). Acute pain, as cognitive science would have it, has as much of the representational as the reprehensible about it, allowing the person-in-pain to approximately point towards it (19). That alone stands as a cognitive ability of significance thanks to evolution. Pain of chronic duration can also be said to be representational, but in the manner that primate social cognition (as a prominent example) permits through expressive communication for others' attention (20). Representing how one is in pain rightly deserves recognition, as pain writes its own prescription for at least commiseration, if not assistance.

A Subjective Objectivity to Pain

Pain speaks, and it speaks to all, and despite its often-ineffable qualities, does not render the sufferer inarticulate – even if others find it difficult to hear and heed adequately. All of our words for describing pain(s) can cloud insight just as much as provide some view to what pain itself really is, while matters remain uncertain about what it means. The question beckons to ask whether pain is biological, or mainly psychological (21,22)? Some combination of both? Always? To what extent? In all who suffer it? The clarity of pain-as-pain (i.e. pain qua painful) can get dispersed or may even be opaque to objective view. That obscurity cannot be rightly blamed on the social necessity of people speaking a common language, or the anthropological creativity of shared folk psychology. We don't describe pain in metaphorical ways because of the theatrical value; rather, we do so to evoke an audience of pathos (23). The person-in-pain seeks to express their subjectivity to others in, through – and solely through – expressively objective ways. We live subjectively by being subjects in view and in sympathy with others. No one else can know my particular pain like I can, but another person can appreciate how I am in pain from its demand to be expressed, however inadequately (24). It is mine while that pain is felt by me, and manifesting phenomenal effect only to me; but gestural expression, illustration, or explanation make my pain partially "knowable" to others, inclusive of those who I seek (and who may profess) to help me. This objective vagary of pain becomes clearly apparent when questions are posed about its origins, causes, prognoses, and remedies.

Despite the objective fact of patterns of neurological activity, the entity "pain" bears its subjectivity, and as such can be entirely transparent only to the one who experiences it. This first person understanding must be "explained" to some extent (via language and/or expression) to others, inclusive of those whose mission obliges them to render aid. But what of those who cannot express or communicate the subjectivity of pain? Objectifying the subjective is – in many ways – fundamental to the problem of assessing and treating pain. This issue gets especially difficult when expressive communication is compromised or absent in the painient individual (25,26). Attempts at imaging and/or biomarking pain, often attaining validity for acute presentation(s), have proven to be more difficult and vague when pain becomes sub-acute or chronic (27-29). Current iterations of neurotechnological assessment of brain structures and functions are less like windows, and more like shaped lenses, and sometimes even mirrors, which reflect back our own image, and interpretation of what brain functions are and mean, rather than affording a "truly" objective view. Such "truth" matters for nothing. Objectivity driven to the point of insensitivity to the subjective, where living bodies are concerned, falls short of full objectivity. Objectivity will always depend on subjectivity since instrumental mea-

surements make sense after correlations with patients' responses to "Does it hurt?" And our instrumental technologies prove their objective worth when remedies bring relief to the experiential subject and patient.

However challenging, such cases present opportunities for scientific advancement, not metaphysical obstructions. Furthermore, taking medical or moral refuge in a resignation to pain's subjective quality could only be a betrayal of any healing profession. There is no patient so exceptional that an exception must be made to a being's susceptibility to pain, or to medicine's service to the painient. Intractable subjectivity can never make a distance too far to try to reach out to, others' suffering. The likelihood of pain prescribes its being attended to with all measured competence.

The topic of pain, perhaps more so than the broader matter of consciousness generally, offers a philosophical opportunity to illustrate how the subjective and the objective are never apart in organic life. Precisely because pain is so intensely subjective it must be objectively effective and affective. It should be superfluous from a biological standpoint to state that anything psychologically affective must somehow be physiologically effective. Yet this connection does not lack in complexity, and surely not for anything so meaningful important as pain. Pain's own voice concurs with this point. Pain we come to idiosyncratically "know" with intimacy does not necessarily feel like any singular or simple feeling. Even if the word "pain" were conventionally delimited to a single sort of feeling (e.g., a "stabbing" or "burning" sensation), any actual pain defies verbal specificity. A pain's reality is still individual, perhaps with as much individuality as the individual sufferer. Pains are personal episodes, complete with all the attendant intuitions, inferences, and implications that are inherent to each individual's life world and lived experience. That complexity should not be surprising, as each person's brain – so central to one's congested and coordinated experience – struggles with that effectively affective power to pain's signaling that demands our joint interpretation.

Pain by Analogy

Having assigned a characteristic individuality (but not idiosyncrasy) to pain that is reflective of the character of life a person leads, the quest for a unified and unifying approach to pain generally may look as if it is receding. Pain brings its own intimacy as a companion, which becomes much less companiable for its duration. But what does – or perhaps should – this mean for an appreciation of others' pain? In most cases, we communicate about pain through analogies, to each other's similar encounters with injury and affliction. Experiential analogy is one thing; neurophysiological analogy is another. A mode of more "direct" access" to another's brain patterns of activity would actually require as much solicitation and interpretation as any conversation. To appreciate our own pain with an import beyond its fearful urgency, higher cognition invoked not by just one brain singly but by many concertedly had to convert affective sensation into emotive information.

Pain reports from patients are not particularly informative without mutual understandings about the questions, word meanings, and cultural conventions about conveying urgency (30,31). That sociality underlying pain's message is due to the unavoidable way that understanding our own pain began in infancy and childhood, instilled from others already understanding how to detect and deal with pain. By what mentalistic process does this happen? Nothing transcendent is needed; evolution already installed enough social cognition to permit much of experience, along with moral empathy, to be thoroughly sociocultural (32). Pain speaks forthrightly and it rightly speaks to us, but it doesn't speak only one language.

The language about pain can rise to the level of simile, metaphor, and allegory, but an understanding of pain rests on analogy (i.e., "It hurts like…"). Having the nerve to tackle the "What is it?" ontological question of pain generally must take into account the organic profiles of those to be studied (33,34). Let's pose a basic premise, namely, when a noxious stimulus is involved with aware cognition, that awareness is of pain. But here we must ask, what level and type of awareness is needed for nociception to be "pain"? All cognition entails and obtains a relative engagement of memory (of the past), current experience, and future anticipation and prediction. In some human cases, consciousness and cognition become covert, and it is unknown which kinds of awareness may be present at varying degrees and levels (35).

Within our human species, ruling out pain for a partially functioning cortex doesn't even rate a credible argument by analogy, given the brain's remarkable resiliency. Arguments from analogy require firm connection between the phenomenon (pain) and the physiology, but given the dynamic network properties of the nervous system, neurology cannot declare that this or that sort of neural architecture is sufficient for pain. Any argument proceeding with "pain is tied to such-and-such nerve circuitry, and this individual lacks

it, so..." isn't an argument with an initial analogy, much less a bad analogy.

Furthermore, the lesson here is not just about our own species (36). Not all cognition must rise to the level of explicit awareness for an organism to render a purpose-like response that is more complex than some neural register or fixed reflex. For animals generally and humans especially, sentience cannot imply felt pain, and felt pain doesn't require waking consciousness. Structure and function are tightly related; yet "multiple realizability" is not unknown to philosophy, nor should it be to science and medicine. Dissimilarity in brains' structures and functions (inclusive of structural changes incurred via injury and/or disease) may well mean that the idiosyncratic experience of pain may differ, but could still be pain nonetheless.

Despite neurophilosophical cautioning about inferring experienced pain, ongoing investigations are illuminating the nervous system and brain as a locus or lens for pain variability, valence, and/or control. However, a lesson to be learned is that fallacies arise when too much weight is placed on this or that trait or feature of the organism in pursuit of reliable correlations with a feeling such as pain (37,38). Pain does possess a unity, not in structural uniformity or functional utility, but in the whole individual where pain is embodied and communicating.

Pain's Prescription

At the outset of this essay we assigned a neurophilosophy of pain to attend to 2 initial tasks and trajectories. First, in the course of appreciating how medical and healthcare specialties bring their various types of expertise to addressing pain, there should be one ontological approach to "What is pain?" that is able to offer substance. Second, to validate pain's eligibility for multi-factorial investigation, the question "How does pain matter?" must be answered with more than platitudes about unpleasantness, interiority, or ideation. Pain should surely evoke profound pathos. Yet pain's prescription will remain unfilled until its full reality is recognized at a personal level, where comprehensive care is mobilized for the whole patient. As we have avowed, and here state again, the humanistic value of mobilization against pain should be reflected in the practice of pain medicine, and the craft of the pain physician. Subsequent essays will propose and explore how a unified delineation of pain can unify its natural reality despite its confusing presentations. That integrated approach to pain would – and we argued, should – better enable a neuroethics of pain to operationalize more informed and sound guidelines for medical inquiry and practice.

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